

In re Application of: Kowalchik et al.  
Attorney Docket No.: EMR-003.01

REMARKS

This Response is filed in reply to the Office Action dated March 10, 2004. In this Response, Applicants amend the specification and title, amend claims 1-3, 5, 12-13, 15-17, 19-20, 23-26, and 29, and traverse the Examiner's rejection of claims 1-29. Amendments to the claims are not an acquiescence to any of the rejections. Further, silence with regard to any of the Examiner's rejections is not an acquiescence to such rejections. Specifically, silence with regard to Examiner's rejection of a dependent claim, when such claim depends from an independent claim that Applicants consider allowable for reasons provided herein, is not an acquiescence to such rejection of the dependent claim(s), but rather a recognition by Applicants that such previously lodged rejection is moot based on Applicants' remarks and/or amendments relative to the independent claim (that Applicants consider allowable) from which the dependent claim(s) depends. Upon entry of the amendments, claims 1-29 are pending in the present application.

The issues of the Office Action are presented below with reference to the Office Action.

With regard to the paragraphs entitled "Double Patenting:"

The Examiner provisionally rejected claims 1 and 20 based on nonstatutory double patenting over claims 1 and 23, respectively, of co-pending Application No. 10/001,317.

As provided herein, amended independent claim 1 of the present application describes a data storage device, the device comprising a device interface for receiving input/output (I/O) requests, more than two disk drives having platter sizes less than 3.5 inches in diameter, and a controller that accesses the disk drives in response to the received I/O requests, where *the controller simultaneously performs at least a part of at least two write operations onto the more than two disk drives in response to at least two different write requests.*

In contrast, independent claim 1 of co-pending Application Serial No. 10/001,317, which the Examiner recited in the present Office Action, currently describes a cache comprising a front-end interface that receives data access requests that specify respective data storage addresses, a back-end interface that can retrieve data identified by the data storage addresses,

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cache storage formed by at least two disks, and a cache manager that services at least some of the requests received at the front-end interface using data stored in the cache storage, *where said cache manager stores, in response to detecting a power failure, identification data identifying addresses within said cache storage where data is stored and the corresponding addresses at a back-end storage area where the data is stored.*

Thus, independent claim 1 of the present application discloses features different from those disclosed in independent claim 1 of co-pending Application Serial No. 10/001,317, for example, a controller that *simultaneously performs at least a part of at least two write operations onto the more than two disk drives in response to at least two different write requests.* Further, independent claim 1 of Application Serial No. 10/001,317 discloses features not disclosed in independent claim 1 of the present application, for example, a cache manager that *stores, in response to detecting a power failure, identification data identifying addresses within said cache storage where data is stored and the corresponding addresses at a back-end storage area where the data is stored.* Additionally, U.S. Patent No. 5,890,207 (to Sne et al.), cited by the Examiner, does not teach either of these features. Since independent claim 1 of the present application and independent claim 1 of co-pending Application Serial No. 10/001,317 each disclose features not disclosed in the other, and since Sne et al. do not teach those different features, Applicants' traverse the Examiner's provisional obviousness-type double patenting rejection of independent claim 1, and consider Applicants' independent claim 1 to be patentably distinct from independent claim 1 of Application Serial No. 10/001,317.

For the same reasons, Applicants traverse the Examiner's provisional obviousness-type double patenting rejection of independent claim 20 of the present application relative to independent claim 23 of Application Serial No. 10/001,317, and consider Applicants' independent claim 20 to be patentably distinct from independent claim 23 of Application Serial No. 10/001,317.

In view of the foregoing, Applicants' respectfully request withdrawal of the Examiner provisional rejections of Applicants' independent claims 1 and 20 based on the doctrine of obviousness-type double patenting.

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With regard to the paragraphs entitled "Specification:"

Applicants respectfully disagree with the Examiner's suggestion for a title change, particularly in view of Applicants' amended independent claim 1, as such claim does not include an interface. Applicants consider the present title to properly reflect the claimed invention of a data storage device.

The application serial number of the co-pending application entitled "Disk Cache Interfacing System and Method" is added to the paragraph appearing on page 1 in the section entitled "Reference to Related Applications", and to the paragraph beginning on page 10, line 1, and ending on page 10, line 14, as requested by the Examiner.

Applicants also capitalized the trademark "INFINIBAND", appearing on page 2 in the paragraph beginning at line 13 and ending at line 20, and on page 6 in the paragraph beginning at line 1 and ending at line 9, as requested by the Examiner.

The Examiner queried the nature of the "protocol" referred to in relation to "INFINIBAND", and other identified protocols. Although Applicants believe that it is inherent from the specification and would be understood by a person skilled in the art, that the protocols referred to, including INFINIBAND, are protocols that facilitate the communication of data between interconnected devices that are compatible with such protocols, for greater clarity, and to expedite prosecution of this application, Applicants add the wording "interconnectivity and/or communications" before the wording "interface protocol such as SCSI (Small Computer System Interface), Fibre Channel, or INFINIBAND." on page 6 in the paragraph beginning at line 1 and ending at line 9.

As suggested by the Examiner, and for greater clarity, Applicants amend claims 5, 15, 16, 17, 19, 20, and 23 to add the word "disk" before the word "drives", and also amend claims 2 and 25 to add the word "device" before the word "interface".

Applicants also amend claim 12 to replace the word "strip" with "stripe". Applicants thank the Examiner for the finding of the typographical error.

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Additionally, Applicants amend claim 13 to more explicitly state the claimed feature that the storage device of claim 1 may be configured to comprise a cache manager. Thus, amended claim 13 describes that a data storage device so configured may, as described on page 10, lines 1-25, comprise a cache manager. Claim 14, which depends on claim 13, describes some operations that the cache manager disclosed in claim 13 may be configured to perform.

With regard to the paragraphs entitled "Claim Rejections - 35 U.S.C. §102". and "Claim Rejections - 35 U.S.C. §103":

Examiner rejected claims 1-7, and 10-29 under 35 U.S.C. §102(b) as being anticipated by Brant et al. (U.S. Patent No. 5,805,787), and rejected claims 8-9 under 35 U.S.C. 103(a) over Brant in view of Eckerd et al (U.S. Patent No. 6,078,498).

Applicants amend independent claim 1 to explicitly state the inherent features of Applicants' independent claim 1 that the controller can simultaneously perform at least a part of at least two write operations onto the disk drives comprising the data storage device, in response to receiving at least two write requests. Applicants also amend independent claim 1 to clarify that the device interface receives input/output (I/O) requests. Support for these amendments may be found, for example, on pages 7-8 of the originally filed application. Independent claim 20, which discloses similar features to those disclosed in Applicants' independent claim 1, and independent claim 24, which is a companion method claim of independent claim 1, are similarly amended. Additionally, Applicants also amend claim 29 to replace the wording "a data access" with "I/O".

Applicants' amended independent claim 1 thus discloses a data storage device, the device comprising more than two disk drives having platter sizes less than 3.5 inches in diameter, and a controller that accesses the disk drives in response to the received I/O requests, where *the controller simultaneously performs at least a part of at least two write operations onto the more than two disk drives in response to at least two different write requests.*

As Examiner knows, and as provided in MPEP 2131, "a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a

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single prior art reference" [emphasis added] (*Verdegaal Bros. v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053). Applicants respectfully submit that Brant does not disclose all the features of Applicants' amended independent claims 1, 20 and 24.

Brant discloses a disk based disk cache interfacing system made of a number of disk drives (see abstract). While Brant also discloses a controller that interfaces with a disk based disk cache array (FIG. 1, and col. 5, lines 54-55) to store and retrieve data to and from disk drives, Brant, in contrast to Applicants' independent claim 1, does not disclose that *the controller simultaneously performs at least a part of at least two write operations onto the more than two disk drives in response to at least two different write requests*. Indeed, as Brant describes in column 2, lines 46-49: "The present invention deliberately uses mapping and caching techniques to replicate data across a multiplicity of disk drives to substantially enhance the ability to quickly recover the data." (emphasis by Applicants) For example, Brant describes a direct mapped strategy for storing data on the disk-based cache and notes that "[a] typical direct mapped write operation writes N copies of the data to the disk based disk cache comprised of N disks with one copy to each disk" (col. 7, lines 6-8). Accordingly, each of Brant's N disks contain a copy of the same and all of the data to facilitate retrieval from any of the disks. Because Brant's write operation must be replicated on all of Brant's N disks, only a single write operation can be performed since the cache's disk drives will *not* be available to store data corresponding to a different (i.e., Applicants' claimed *at least two*) write operation. Thus, Brant does not teach or suggest Applicants' claimed controller that *simultaneously performs at least a part of at least two write operations onto the more than two disk drives in response to at least two different write requests*.

Since Brant does not teach Applicants' independent claim 1 feature of *a controller that simultaneously performs at least a part of at least two write operations onto the more than two disk drives in response to at least two different write requests*, Applicants traverse the Examiner's 35 U.S.C. §102(b) rejection of independent claim 1, and consider independent claim 1 to be allowable. Applicants also traverse the Examiner's rejections of dependent claims 2-19, and consider claims 2-19 allowable for depending from an allowable base claim.

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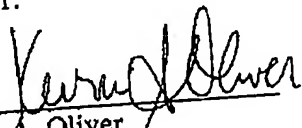
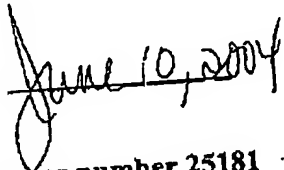
Independent system claim 20, and independent claim 24, which is a companion method claim to allowable independent claim 1, both disclose features similar to those disclosed in Applicants' allowable independent claim 1. For the reasons stated previously with respect to Applicants' allowable independent claim 1, Applicants traverse Examiner's rejection of independent claims 20 and 24 and consider independent claims 20 and 24 to be allowable. Since claims 21-23, and 25-29 depend from allowable independent claims 20 and 24, respectively, Applicants traverse the Examiner's rejections of such dependent claims, and consider claims 20-23, and 25-29 to also be allowable as depending from an allowable base claim.

06/10/2004 12:31 617-832-7000

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In view of the foregoing remarks, Applicants submits that the response herein is fully responsive to the subject Office Action, and that the pending claims are patentable over the cited prior art. Accordingly, Applicants submit that the claims are now in condition for allowance. Withdrawal of the pending rejections, and favorable reconsideration are respectfully solicited. If there are any remaining issues or the Examiner believes that a telephone conversation with Applicants' attorney would be helpful in expediting the prosecution of this application, the Examiner is invited to call the undersigned at 617-832-1241.

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